

CLAIMS

What is claimed is:

- 5 1. A pulser circuit for generating an electrical pulse of short duration for use in an atom probe, comprising:
 - (a) a circuit comprising at least a first node ;
 - (b) a voltage supply for charging the first node;
 - (b) a switching network having a first switch operable between a conductive state
- 10 for shorting the first node to a grounded node and a nonconductive state for opening the circuit between the first node and the grounded node, and an RC network having a time constant of less than 33 microseconds, comprising at least one resistor connected between the first node and the voltage supply, and wherein the capacitance is a combination of the switch capacitance and at least one capacitor connected to the
- 15 node, and
 - (d) wherein the switch is in a nonconductive state to charge the RC network and the switch is in a conductive state to discharge the RC network, thereby generating the electrical pulse.
- 20 2. The pulser circuit of claim 1 further comprising a controllable shaping network for providing pulses of selectable amplitudes and shapes.
- 25 3. The pulser circuit of claim 1 further comprising at least one switching network connected in series with the RC network
4. The pulser circuit of claim 1 further comprising a shunting network for shunting transients to a low impedance node.

5. A pulser circuit for generating an electrical pulse of short duration for use in an atom probe, comprising:
 - (a) a circuit comprising at least a first node ;
 - (b) a voltage supply for charging the first node;
- 5 (c) a switch operable between a conductive state for shorting the first node to a grounded node and a nonconductive state for opening the circuit between the first node and the grounded node;
- 10 (d) a controllable RC network, comprising at least one resistor connected between the first node and the voltage supply, and wherein the capacitance is a combination of the switch capacitance and at least one capacitor connected to the node, for generating pulses having selectable amplitudes and shapes; and
- 10 (e) wherein the switch is in a nonconductive state to charge the RC network and the switch is in a conductive state to discharge the RC network, thereby generating the electrical pulse.

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6. A pulser circuit for generating an electrical pulse of short duration for use in an atom probe, comprising:
- (a) a circuit comprising at least a first node ;
 - (b) a voltage supply for charging the first node;
- 5 (c) a first switch operable between a conductive state for shorting the first node to a grounded node and a nonconductive state for opening the circuit between the first node and the grounded node;
- (d) an RC network, comprising at least one resistor connected between the first node and the voltage supply, and wherein the capacitance is a combination of the 10 switch capacitance and at least one capacitor connected to the node,
- (e) at least one or more second switching networks connected in series;
- (f) wherein the switch is in a nonconductive state to charge the RC network and the switch is in a conductive state to discharge the RC network, thereby generating the electrical pulse.